

36885 County 24 Blvd
Dennison, MN 55018
June 17, 2009

MS Stephanie Strength
Environmental Protection Specialist
United States Department of Agriculture
Rural Utilities Service
Engineering and Environmental Staff
1400 Independence Avenue SW
Stop 1571
Washington, DC 20250-1571

Dear MS Strength:

Attached is a document I prepared describing how electric transmission lines affect the various farming practices. Many of the decision makers do not have a farm background, so I thought it was important to explain in detail a farmer's point of view.

I am a retired federal employee living on our home farm. I was the Minnesota state design engineer for the Soil Conservation Service, USDA; retiring after 32 years of service. The agency is known as the Natural Resource Conservation Service.

If you have any further questions on my written concerns and observations, please give me a call. My telephone number is 507-789-6765. We need to protect our clean water and good cropland because hard working farmers are trying to provide a reliable food and bio-fuel supply while protecting the innumerable fragile natural resources of our community.

Sincerely,


Howard C. Midje

Witnessed June 17th, 2009

Interruption of Farm Practices

I-022-005

Place CapX2020 electric transmission lines on road right-of-ways, stay away from fields and do not cut across farms. If USDA federal funds through the Rural Utilities Service are used to finance this reach of the transmission line, the agricultural resources of the area and the productive land on our family farms should be strictly protected.

We are Louise and Howard Midje who farm in Warsaw township, Goodhue County. We have two parcels which transect continuously one and one-half miles perpendicular to one of the alternative CAPX2020 transmission line. We will discuss how a transmission line across our property will interrupt most of our farming practices. It is extremely important that when selecting the line location to not divide farms! The farm property lines should be strictly observed. The practices of concern are as follows:

1. Contour Terraces

I-022-006

We have approximately 70 acres with contour terraces. There are four parallel terraces about 1/3 mile long. These terraces have a 228 foot spacing from terrace channel to channel. This yields individual fields 184 feet wide by 1/3 mile long. When we built these terraces in 2001, at a cost of about \$24,000, they were designed for a 12 row corn planter with 30 inch spacing. This means that each individual field could be planted with 6 passes of the planter or 3 full rounds. Since that time, our renter has now switched to a 24 row planter with the same row spacing. This now means he makes 3 passes or 1 1/2 rounds between each terrace. The latest trend now is 36 row planters which means 2 passes or one round between the parallel terraces. The new John Deere 36 row planter has a price tag of \$240,000 and a tractor large enough to pull it costs \$250,000 with GPS guidance system. This leads up to my question. What do I do if a CAPX2020 grid power pole is placed within the 184 foot wide field between the individual terraces? I cannot cross the terrace because the ridge is too high. The 24 row planter is nearly too wide to turn around in the 184 feet, not to think about a 36 row planter. The only other alternative is to abandoned the entire field 184 feet by 1/3 mile between two terraces.

2. Tile Drainage

I-022-001

Most of the farm land in southern Minnesota has tile drainage as a conservation practice. The tile drains may be on individual farms or may be part of a group drainage system encompassing several farms. It yet remains the most profitable practice for farmers to use to increase crop production. The tile systems are put in as random or grid systems. Both systems use a herring bone layout with parallel lines spaced from 70 to 90 feet depending on the soil type. Most of the laterals in the systems are 4 to 5 inch diameter with an installation cost of about one dollar per foot. The tiles are generally 42 to 48 inches deep. Tile mains may be as large as 10 to 12 inches or larger. Installation of these cost five dollars a foot or more. When CAPX2020 purchases easements 175 feet wide, they are assured to affect tile lines whether they be laterals or mains. Heavy construction equipment can crush the tile lines. Foundation footings for towers can certainly block an existing line. What happens when a tile line is blocked? A blow hole develops in the field above the blockage. The pressure in the blocked tile builds up because of the pressure from water in the tile from up the hill or slope on the farm. This will soon build up a pressure great enough to blow out a hole above the plug. These holes are generally 10 to 15 feet in diameter and four feet deep. Heavy delivery, gravel and concrete truck cause excessive soil loading that would crush the lines. Large farm equipment is also very heavy but has a much

I-022-001

Your comment has been noted. Potential impacts to agricultural resources will be addressed in the Draft Environmental Impact Statement.

The Draft Environmental Impact Statement will be available on the RUS website at: <http://www.usda.gov/rus/water/ees/eis.htm>. Comments will be solicited after its publication.

I-022-001

greater foot print under the tires. The larger the foot print under a vehicle the lower the pressure under the tires in pounds per square inch. Farm equipment is designed to minimize the pressure to compact the soil. This is why rubber tracked tractors are becoming more popular. The mentioned blow holes in the field can cause much damage to farm equipment. When one is harvesting corn with a 12 row header on a large combine at 5 to 6 miles per hour, it is impossible to see these blow holes before you are in it. The cost to fill the blow hole and repair the tile is not that great, but the repair of \$300,000 combine can be prohibitive. How do we determine the cost of such problems attributed to CAPX 175 foot easements?

3. Center Pivot Irrigation.

I-022-002

Much of Dakota Counties farm land is or will soon be irrigated with center pivot irrigation systems. Cap X 2020 transmission lines will certainly disrupt or prevent one from installing a center pivot irrigation system. Not using irrigation systems on lighter soils or soils with sandy or gravely subsoils reduce the potential of increasing your crop yields. In today's market, with increasing input costs for crop production, every farmer has to maximize his profit margin. We personally have been lucky that we haven't needed irrigation, but as global warming continues more and more farmers may see the need for irrigation. With the climate change, new crop management techniques, government regulation of water usage and changes in crops that we may raise; farmers will find that the grid power poles will make it unacceptable to use irrigation. This will be the demise of the farmer's operation and the loss of his farm's value for agriculture.

I-022-007

4. GPS Guidance Control of Modern Equipment

Global Positioning Systems (GPS) is the latest in farm machinery guidance systems. Large farmers are using this system for its' efficient control tillage equipment. The farmer will drive the tractor for the first outside round of the field and set the proper coordinates, from this point on, the tractor guides its self until the field is completed. The main reason it improves efficiency is because the farmer can set the overlap from one pass of the tillage equipment. This overlap can set down to 6 or even 3 inches, depending on the accuracy of the system. The more accurate a system is, the more the initial cost of the guidance system. An example of this is our renter, whose Father celebrated his 80th birthday last fall. After the boundary of the field is fed into the system, this happy grandfather rides in the tractor drinking coffee and listening to the radio until the field is complete. This system is also used when planting row crops on irregular shaped fields. When the field is nearly complete and you end up on point rows; the system will shut off consecutively planter rows where it begins to over seed adjacent rows. This is a real efficiency to save on wasted seed. Harvest time is when GPS is also used. When the combine harvests a crop, it records the yield though the field in relation to the location in the field. This data is then used the following spring to regulate the rate of fertilizer application.

The GPS system will not identify items in the middle of a field such as a Cap X transmission tower. It will also not identify any movable objects in the field such as another tractor or truck in the field. This is why Grandpa has to ride in the cab and look out for such objects or identify trouble with the equipment. Also when a combine has to stop to go around an object in the field such as power poles, it disrupts the flow of grain through the system, the measurement of the yield per acre will not be accurate resulting in inaccurate fertilizer placement the following spring.

I-022-003

The question we do not have an answer for is: "Does the electromagnetic field generated by the electric transmission lines affect the operation of the GPS guidance system of the farm

I-022-002

Your letter/comment card has been noted. Please refer to comment response I-022-001.

I-022-003

Your comment has been noted. Interference with electrical equipment caused by the transmission lines will be addressed with individual landowners if the problem arises.

I-022-003

machinery? The manufacturers of agricultural GPS guidance systems tell us that electrical transmission lines and petroleum pipe lines energized to detect leaks can interfere with GPS guidance systems. How does a farmer determine the cost of damages caused by the transmission lines on his property when he relies on GPS guidance systems?

I-022-008

5. Effects of Livestock

We do not have any livestock on our farm, but many of our neighbors do. It is well known that stray current has an effect of livestock in confinement. Grazing livestock in pastures are also affected by the electromagnet field generated by the overhead transmission lines. Research work has been done in Germany where numerous transmission lines run in the east-west direction. The research has been done by a team directed by Hynek Burda and Sabine Begall. I'm sure many of our neighbors with livestock have additional information on the effects on livestock.

Summary

In summary, I would like to bring to your attention to a picture I found (see the following page) with a caption that reads:

WHAT A DAY

A Tangled Mess

Despite a wide-open field and ideal spring conditions
this seeding rig found itself snarled amongst power
lines. Planting came to a halt as well as the electrical
supply of those on the power grid.

Obviously the GPS guidance system failed within the electromagnetic field or the hired help failed to estimate the width of his equipment. This raises an other question! How high should a farmer raise his liability insurance to cover an accident, such as this when his hired operator knocks down a power grid pole. Keep in mind, the farming businesses are now operating on a small margin of profit.

I-022-004

How does a farmer determine the total cost of the interference to his farm practices due to the presence of the electric transmission line on his farm? Does he have any other viable option than to have CapX2020 buy his/her entire farming operation?

By: Howard C. Midje 6-9-09

Minnesota State Design Engineer, Retired - Soil Conservation Service, USDA

Presently: Natural Resource Conservation Service NRCS - USDA

I-022-004

Your comment has been noted. RUS anticipates that the CapX2020 Utilities would pay for land rights based on an independent appraisal and will work with property owners to negotiate easement payments after the permitting process.

I-022-005

Your comment has been noted. The criteria used to route the transmission line is described in the Macro Corridor Study which is available on the RUS website at:
<http://www.usda.gov/rus/water/ees/eis.htm>. These criteria and routing process will be addressed in the Draft Environmental Impact Statement. The project is still in the development and planning stages and the utilities have not yet permitted a route for the transmission line.

I-022-006

Your comment has been noted. The criteria used to route the transmission line is described in the Macro Corridor Study which is available on the RUS website at:
<http://www.usda.gov/rus/water/ees/eis.htm>. These criteria and routing process will be addressed in the Draft Environmental Impact Statement. The project is still in the development and planning stages and the utilities have not yet permitted a route for the transmission line.

I-022-007

Your comment has been noted. Potential impacts to social and economic resources will be addressed in the Draft Environmental Impact Statement.

I-022-008

Your letter/comment card has been noted. Please refer to comment response I-022-007.

What a Day!

A Tangled Mess

Despite a wide-open field and ideal spring conditions, this seeding rig found itself snarled amongst power lines. Planting came to a halt as well as the electrical supply of those on the power grid.



If you've had one of those days—or caught someone else's on film—we'd love to share it with our readers. E-mail high-resolution images to khumphreys@farmjournal.com, or mail prints or slides to *What a Day!*, FARM JOURNAL, P.O. Box 958, Mexico, MO 65265. Photos for publication will be selected on a first-come basis.

Interruption of Farm Practices

Place CapX2020 electric transmission lines on road right-of-ways, stay away from fields and do not cut across farms. If USDA federal funds through the Rural Utilities Service are used to finance this reach of the transmission line, the agricultural resources of the area and the productive land on our family farms should be strictly protected.

We are Louise and Howard Midje who farm in Warsaw township, Goodhue County. We have two parcels which transect continuously one and one-half miles perpendicular to one of the alternative CAPX2020 transmission line. We will discuss how a transmission line across our property will interrupt most of our farming practices. It is extremely important that when selecting the line location to not divide farms! The farm property lines should be strictly observed. The practices of concern are as follows:

1. Contour Terraces

We have approximately 70 acres with contour terraces. There are four parallel terraces about 1/3 mile long. These terraces have a 228 foot spacing from terrace channel to channel. This yields individual fields 184 feet wide by 1/3 mile long. When we built these terraces in 2001, at a cost of about \$24,000, they were designed for a 12 row corn planter with 30 inch spacing. This means that each individual field could be planted with 6 passes of the planter or 3 full rounds. Since that time, our renter has now switched to a 24 row planter with the same row spacing. This now means he makes 3 passes or 1 1/2 rounds between each terrace. The latest trend now is 36 row planters which means 2 passes or one round between the parallel terraces. The new John Deere 36 row planter has a price tag of \$240,000 and a tractor large enough to pull it costs \$250,000 with GPS guidance system. This leads up to my question. What do I do if a CAPX2020 grid power pole is placed within the 184 foot wide field between the individual terraces? I cannot cross the terrace because the ridge is too high. The 24 row planter is nearly too wide to turn around in the 184 feet, not to think about a 36 row planter. The only other alternative is to abandon the entire field 184 feet by 1/3 mile between two terraces.

2. Tile Drainage

Most of the farm land in southern Minnesota has tile drainage as a conservation practice. The tile drains may be on individual farms or may be part of a group drainage system encompassing several farms. It yet remains the most profitable practice for farmers to use to increase crop production. The tile systems are put in as random or grid systems. Both systems use a herring bone layout with parallel lines spaced from 70 to 90 feet depending on the soil type. Most of the laterals in the systems are 4 to 5 inch diameter with an installation cost of about one dollar per foot. The tiles are generally 42 to 48 inches deep. Tile mains may be as large as 10 to 12 inches or larger. Installation of these cost five dollars a foot or more. When CAPX2020 purchases easements 175 feet wide, they are assured to affect tile lines whether they be laterals or mains. Heavy construction equipment can crush the tile lines. Foundation footings for towers can certainly block an existing line. What happens when a tile line is blocked? A blow hole develops in the field above the blockage. The pressure in the blocked tile builds up because of the pressure from water in the tile from up the hill or slope on the farm. This will soon build up a pressure great enough to blow out a hole above the plug. These holes are generally 10 to 15 feet in diameter and four feet deep. Heavy delivery, gravel and concrete truck cause excessive soil loading that would crush the lines. Large farm equipment is also very heavy but has a much

greater foot print under the tires. The larger the foot print under a vehicle the lower the pressure under the tires in pounds per square inch. Farm equipment is designed to minimize the pressure to compact the soil. This is why rubber tracked tractors are becoming more popular. The mentioned blow holes in the field can cause much damage to farm equipment. When one is harvesting corn with a 12 row header on a large combine at 5 to 6 miles per hour, it is impossible to see these blow holes before you are in it. The cost to fill the blow hole and repair the tile is not that great, but the repair of \$300,000 combine can be prohibitive. How do we determine the cost of such problems attributed to CAPX 175 foot easements?

3. Center Pivot Irrigation.

Much of Dakota Counties farm land is or will soon be irrigated with center pivot irrigation systems. Cap X 2020 transmission lines will certainly disrupt or prevent one from installing a center pivot irrigation system. Not using irrigation systems on lighter soils or soils with sandy or gravely subsoils reduce the potential of increasing your crop yields. In today's market, with increasing input costs for crop production, every farmer has to maximize his profit margin. We personally have been lucky that we haven't needed irrigation, but as global warming continues more and more farmers may see the need for irrigation. With the climate change, new crop management techniques, government regulation of water usage and changes in crops that we may raise; farmers will find that the grid power poles will make it unacceptable to use irrigation. This will be the demise of the farmer's operation and the loss of his farm's value for agriculture.

4. GPS Guidance Control of Modern Equipment

Global Positioning Systems (GPS) is the latest in farm machinery guidance systems. Large farmers are using this system for its' efficient control tillage equipment. The farmer will drive the tractor for the first outside round of the field and set the proper coordinates, from this point on, the tractor guides its self until the field is completed. The main reason it improves efficiency is because the farmer can set the overlap from one pass of the tillage equipment. This overlap can set down to 6 or even 3 inches, depending on the accuracy of the system. The more accurate a system is, the more the initial cost of the guidance system. An example of this is our renter, whose Father celebrated his 80th birthday last fall. After the boundary of the field is fed into the system, this happy grandfather rides in the tractor drinking coffee and listening to the radio until the field is complete. This system is also used when planting row crops on irregular shaped fields. When the field is nearly complete and you end up on point rows; the system will shut off consecutively planter rows where it begins to over seed adjacent rows. This is a real efficiency to save on wasted seed. Harvest time is when GPS is also used. When the combine harvests a crop, it records the yield though the field in relation to the location in the field. This data is then used the following spring to regulate the rate of fertilizer application.

The GPS system will not identify items in the middle of a field such as a Cap X transmission tower. It will also not identify any movable objects in the field such as another tractor or truck in the field. This is why Grandpa has to ride in the cab and look out for such objects or identify trouble with the equipment. Also when a combine has to stop to go around an object in the field such as power poles, it disrupts the flow of grain through the system, the measurement of the yield per acre will not be accurate resulting in inaccurate fertilizer placement the following spring.

The question we do not have an answer for is: "Does the electromagnetic field generated by the electric transmission lines affect the operation of the GPS guidance system of the farm

machinery? The manufacturers of agricultural GPS guidance systems tell us that electrical transmission lines and petroleum pipe lines energized to detect leaks can interfere with GPS guidance systems. How does a farmer determine the cost of damages caused by the transmission lines on his property when he relies on GPS guidance systems?

5. Effects of Livestock

We do not have any livestock on our farm, but many of our neighbors do. It is well known that stray current has an effect of livestock in confinement. Grazing livestock in pastures are also affected by the electromagnetic field generated by the overhead transmission lines. Research work has been done in Germany where numerous transmission lines run in the east-west direction. The research has been done by a team directed by Hynek Burda and Sabine Begall. I'm sure many of our neighbors with livestock have additional information on the effects on livestock.

Summary

In summary, I would like to bring to your attention to a picture I found (see the following page) with a caption that reads:

WHAT A DAY

A Tangled Mess

Despite a wide-open field and ideal spring conditions
this seeding rig found itself snarled amongst power
lines. Planting came to a halt as well as the electrical
supply of those on the power grid.

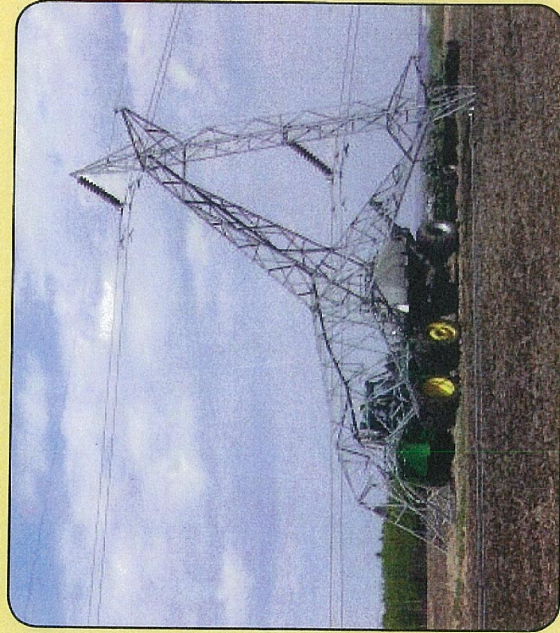
Obviously the GPS guidance system failed within the electromagnetic field or the hired help failed to estimate the width of his equipment. This raises an other question! How high should a farmer raise his liability insurance to cover an accident, such as this when his hired operator knocks down a power grid pole. Keep in mind, the farming businesses are now operating on a small margin of profit.

How does a farmer determine the total cost of the interference to his farm practices due to the presence of the electric transmission line on his farm? Does he have any other viable option than to have CapX2020 buy his/her entire farming operation?

By: Howard C. Midje 6-9-09

Minnesota State Design Engineer, Retired - Soil Conservation Service, USDA

Presently: Natural Resource Conservation Service NRCS - USDA



What a Day!

A Tangled Mess

Despite a wide-open field and ideal spring conditions, this seeding rig found itself snarled amongst power lines. Planting came to a halt as well as the electrical supply of those on the power grid.

If you've had one of those days—or caught someone else's on film—we'd love to share it with our readers. E-mail high-resolution images to khumphreys@farmjournal.com, or mail prints or slides to *What a Day!*, FARM JOURNAL, P.O. Box 958, Mexico, MO 65265. Photos for publication will be selected on a first-come basis.